We claim:

- 1. Isolated, dimeric FAP α molecule, having a molecular weight of about 170 kilodaltons as determined by SDS-PAGE, wherein said dimeric FAP α molecule is capable of degrading extracellular matrix proteins.
- 2. The dimeric FAPα molecule of claim 1, wherein each monomer of said dimeric FAPα molecule consists of the amino acid sequence of SEQ ID NO: 2.
- 3. The dimeric FAP α molecule of claim 1, produced recombinantly.
- 4. The dimeric FAP α molecule of claim 3, produced by a eukaryotic cell.
- Isolated protein consisting of:
 (i) the FAPα catalytic domain, and
 (ii) at least one portion of a non FAPα protein.
- 6. Method for cleaving a terminal dipeptide of formula Xaa-Pro from a molecule, comprising contacting said molecule with a second molecule, said second molecule having FAPα enzymatic activity.

- 7. The method of claim 6, wherein said second molecule is isolated, dimeric $FAP\alpha$.
- 8. The method of claim 6, wherein said second molecule comprises an FAPlpha catalytic domain.
- 9. Method for identifying an enzyme inhibitor, comprising combining:
 - (i) a molecule having FAP α enzymatic activity;
 - (ii) a substrate for said molecule;
 - (iii) a substance believed to be an enzyme inhibitor; and
 - (iv) determining activity of (i) on (ii), wherein a decrease in activity when (iii) is present as compared to activity when (iii) is absent indicates that said substance is an enzyme inhibitor.
- 10. The method of claim 9, wherein said molecule is isolated dimeric $FAP\alpha$.
- 11. The method of claim 9, wherein said molecule comprises an FAPlpha catalytic domain.

- 12. Method for treating a subject with a pathological condition characterized by FAP α expression, comprising administering to said subject an amount of a FAP α inhibitor sufficient to inhibit enzyme activity of FAP α .
- 13. The method of claim 12, wherein said inhibitor is a monoclonal antibody.
- 14. The method of claim 12, wherein said inhibitor is a collagen derivative.
- 15. The method of claim 12, wherein said pathological condition is a cancer.

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